

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

CASCADES COMPUTER
INNOVATION, LLC,

Plaintiff,

v.

SAMSUNG ELECTRONICS CO., LTD.,

Defendant.

Civil Action No. 1:11-cv-04574

Honorable Matthew F. Kennelly

**CASCADES' MEMORANDUM IN OPPOSITION TO SAMSUNG'S
MOTION FOR JUDGMENT AS A MATTER OF LAW AS TO PATENT
INFRINGEMENT, DAMAGES AND WILLFULNESS**

I. STANDARD FOR JUDGMENT AS A MATTER OF LAW

A trial court cannot grant judgment as a matter of law unless “a reasonable jury would not have a legally sufficient evidentiary basis to find for the [nonmoving] party.” Fed.R.Civ.P. 501(a)(1); *see Thomas v. Cook County Sheriff's Dep't*, 604 F.3d 293 300-01 (7th Cir. 2009). A trial court “do[es] not weigh evidence or assess the credibility of witnesses. Instead, [it] draw[s] all reasonable inferences in favor of the nonmoving party.” *Golden v. World Security Bureau, Inc.*, 988 F.Supp.2d 850 (N.D. Ill. 2013).

II. SAMSUNG'S ARGUMENT REGARDING MR. PURDY'S TESTIMONY

Samsung has argued that, during its cross-examination of Mr. Purdy, he admitted the result of the invention was achieved by Samsung in a different way, even though “literally” every claim element was being practiced:

Q. So, again, the result is the same but *literally* they're being done in different ways. Fair?

A. They're doing it -- there's a distinction there but --

Q. Yeah.

A. Yeah.

Q. They're *literally* doing it a different way, correct?

A. Yes.

(Trial Tr. at 824; emphasis added). Mr. Purdy was discussing different ways to literally practice the “raising exceptions” element (Trial Tr. at 822:24-823:3). He showed there was literal infringement. Yet, on the basis of this snippet of testimony, Samsung has asked for a directed verdict of non-infringement and now JMOL (Dkt. 341).

This resurrects the long-discredited defense called the reverse doctrine of equivalents -- a doctrine repeatedly rejected by the Federal Circuit:

Not once has this court affirmed a decision finding noninfringement based on the reverse doctrine of equivalents. And with good reason: when Congress enacted 35 U.S.C. § 112, after the decision in *Graver Tank*, it imposed requirements for the written description, enablement, definiteness, and means-plus-function claims that are co-extensive with the broadest possible reach of the reverse doctrine of equivalents.

Tate Access Floors, Inc. v. Interface Architectural Resources, Inc., 279 F.3d 1357, 1368 (Fed. Cir. 2002).

Independently, there is compelling evidence that the JIT Compiler tests the exceptions, therefore, the *exceptions must arise* in the JIT Compiler:

Q. Okay. And when does the problem arise?

A. The problem is arising at the point that you check and detect it.

Q. And at that point in time, does the JIT Compiler then address it?

A. The JIT Compiler generates the code, and it's that compare and branch on zero that both detects and begins the error handling process, the exception handling process, sorry.

(Trial Tr. at 814-815).

Q. What does the test -- let me read the whole thing.

The Dalvik JIT Compiler, and then it goes on, tests for exception conditions. Does that happen?

A. Yes, it does.

Q. Is that an admission by Samsung that, in fact, it happens?

A. Yes. And if we include the next sentence, it describes exactly what it does. If the exception or condition is detected, control flow will go to a rollback block that resets the machine state to the beginning of the Dalvik instruction that caused the exception control to hand it off to the interpreter; that is, it detected the condition and it's beginning to do its exception condition handling.

Q. So he not only admits that it happens, but he describes how the JIT Compiler solves the problem?

A. Yeah, the JIT Compiler generates the host code that includes these steps.

(Trial Tr. at 815-816).

The evidence established the '750 patent itself describes that common exceptions arise with *detection*, not just execution:

Common exceptions *arise*, by way of example, when the denominator is zero and a divide instruction is executed; when an overflow occurs as the result of an arithmetic operation; when an invalid processor instruction is encountered; when a page fault occurs or when an illegal operation is *detected*.

(PX-1, Col. 2, lines 37-43). There is substantial testimony that exceptions arise in the JIT Compiler (Trial Tr. 985-987-989).

III. THERE IS OTHER SUBSTANTIAL EVIDENCE OF INFRINGEMENT

Literal infringement – whether the claims read on the accused product – is an issue of fact. *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*, 117 S.Ct. 1040, 1048 (1997) and “substantial evidence” is “such relevant evidence from the record taken as a whole as might be accepted by a reasonable mind as adequate to support the finding under review.” *Texas Instruments v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1563 (Fed. Cir. 1996).

A. The Infringing Samsung Products

Samsung's smartphones and tablets use a Dalvik machine with a Just-In-Time ("JIT") Compiler. The JIT Compilers include routines for handling precise exceptions so as to translate "foreign" code (*e.g.*, Java bytecoded instructions) to "host" code (*e.g.*, binary ARM instructions, in the case of an Android phone with an ARM processor) for execution.

There was sufficient evidence of infringement from the testimony of Alan Purdy and documents (including Samsung and Google Android source code) to support a finding of infringement. Mr. Purdy testified that he examined actual Samsung phones (Trial Tr. at 627) and analyzed all versions of Android between 2.2 and 4.4.2. He found that each and every one of the phones practice the inventions of claims 1 and 15 of the '750 patent (Trial Tr. at 632 ("Yes, all of the versions between Froyo and KitKat practice the two claims"); PX-181). Mr. Purdy also testified that each of the 194 accused Samsung devices include each and every element of claims 1 and 15 of the '750 patent (Trial Tr. at 628-630 ("It identifies each of the 194 models"), 665-666; see PX-174).

B. There Is Substantial Evidence Of Direct Infringement Of Claim 1

Contrary to Samsung's arguments, there was substantial evidence of infringement of claim 1 of the '750 patent.

1. Element A – Non-Optimized "Foreign Code" Execution Module

Cascades' expert Mr. Purdy testified that each of the accused Samsung phones contains a non-optimized foreign code execution module:

Q. Now, in terms of the -- I'm sorry, the non-optimized foreign code execution module, did you find that?

A. Yes.

Q. Where?

A. That's the Java -- the Dalvik Java interpreter, the non -- so this is a non-optimizing foreign code execution module. This is A.

(Trial Tr. at 668). Mr. Purdy identified the operation of the source code (Trial Tr. 672-673; PX-188) and explained, through animations (PDX-124; PDX-98), how the interpreter took “the foreign encoded program and its iterating through each of the instructions that actually runs and emulates each of the different kinds of instructions are in the Dalvik instruction set” (Trial Tr. at 669).

2. Element B – Optimizing Binary Translator

Samsung's source code confirms the presence of an optimized binary translator in each of the accused devices (PX-188 and PX-401). Mr. Purdy explained the presence of the optimized binary translator in the Samsung source code:

A. Sure. The phones that I examined and the source code that I examined all contain the optimizing binary translator which corresponds to the Just-In-Time compiler. That's the functional component that converts Java bytecodes into the host CPU instructions. That was in all of the versions that I've looked at.

(Trial Tr. at 671). Mr. Purdy further explained that a presentation by Google, the creators of the Android operating system, shows the “other part of the solution is the Just-In-Time Compiler that translates byte code to *optimized* native code at runtime, supported the presence of this claim element (Trial Tr. at 673; PDX-119). The Dalvik virtual machine is the portion of the Samsung source code that comprises the optimizing binary translator (Trial Tr. at 671-672).

3. Element C – CPU

There is no dispute here -- ample evidence showed the presence of a CPU as required by element C of claim 1 (Trial Tr. at 640-641). Additionally, evidence was presented in the form of a data sheet for a Samsung Galaxy SII device which indicated the presence of a CPU (PX-474; Trial Tr. at 642-643, 650-655). Samsung “provides a spec sheet that identifies which CPU

and which version of the CPU each one of these devices has embodied in it” (Trial Tr. at 640-641).

**4. Element D – Documentation Generator
Configured to Generate a Set of Documentations**

In analyzing the Samsung source code contained in the Dalvik virtual machine, Mr. Purdy found the presence of the “documentation generator” element of claim 1 (PX-192).

A. The documentation generator is a component in the Just-In-Time compiler. And *its purpose is to generate what they call here a set of documentation* that are designed to return the foreign state back to a consistent state if certain classes of errors arise when executing the code that the Just-In-Time compiler is generating.

(Trial Tr. 673; emphasis added). Plaintiff’s Exhibit PX-194 is a portion of Samsung’s source code which demonstrating Samsung’s practice of this element:

Q. Can you tell what that is?

A. Yes. It’s a portion of the code generator.

Q. Did you study this code?

A. Yes, I did.

Q. And what did you find?

A. It embodies the generation of documentation for the optimized host sequences.

(Trial Tr. at 675; see also Trial Tr. at 675-676; PX-194; PX-193). Plaintiff’s Exhibit PX-194 is a piece of the Dalvik Compiler, the JIT Compiler, which represents the “code generator” element of claim 1 of the ‘750 patent (Trial Tr. 674-676): “[The element] was present.”). Document generator in the Samsung phones is configured to generate two or more documentations for the host operations:

Q. Is the document generator in the Samsung phones, which you found in those phones, is that configured to generate two or more documentations for the host operations?

A. Yes, it is.

Q. Can you explain why?

A. Sure. When the chip compiler takes a block of code, there may be more than one location in there where it needs to raise an exception. Every time the documentation generator notices where it needs to put in a recovery code, it will add to a list that -- a list of documents that are appropriate for this particular block of code. So in that respect, it's able to handle multiple blocks.

(Trial Tr. at 700); see also, Trial Tr. 707-709; PX-193 and PX-194: “set up the place holder to reconstruct this Dalvik PC”). Thus, the source code “keeps track of the place where it’s going to be resuming in case the exception is being raised,” satisfying the claim language that each documentation required to calculate a corresponding foreign state (Trial Tr. 709-710:17-20; PX-193-194).

5. Element E – Document Tracker

Mr. Purdy provided testimony that the Dalvik virtual machine in the Samsung phones included the “document tracker” element:

Q. All right. Document tracker, did you find that?

A. Yes, I did.

Q. -- in each and every one of the phones that’s accused of infringement?

A. Yes, I did. I looked at the range – for all of these elements, I looked at the source code versions all the way from Foyo to KitKat, and they all had equivalent fragments of source code that I’m citing to here.

(Trial Tr. at 676-677; PTX-181). Mr. Purdy explained how the Samsung phones included a document tracker configured to record host operation addresses at appropriate points of the operation:

Q. Okay. Tell us then how this tracker, documentation tracker, works?
I assume that's right over here.

A. Okay. The documentation tracker, you know, again, is -- basically lines up in the host-generated code a location that corresponds to where it needs to go back to. So that is the place where it generates the foreign program counter which we saw in the example.

Q. Okay. Is there code associated with that?

A. Yes, there is.

(Trial Tr. at 711; PX-192). Mr. Purdy explained how the document tracker operates with the document generator to ensure where to branch if an exception arises:

A. So the documentation generator works with the documentation tracker, and the whole purpose of this is to line up the host-generated code to figure out where it needs to go in the case -- where it needs to go in the foreign code to make sure that it understands keeping the foreign state in sync, that it has to make sure it knows where to branch to in the case of an exception raising in this particular location at the host sequence of generated code.

(Trial Tr. at 710:17-24; PX-193, PX-194).

6. Element F – Recovery Mechanism -- “Exceptions Arisen”

The recited recovery mechanism configured to select a documentation in the set of documentations element is present in the Samsung phones:

A. If an exception is raised, it will select one document from the set of documentations and it will do what it says to initiate the recovery process.

Q. But it can and does take two or more?

A. Yeah.

(Trial Tr. at 701). The recovery mechanism of the Samsung phones calculates a foreign state and continues to execute foreign codes in cases of the exception arising:

Q. When this recovering mechanism calculates a foreign state, and I think you showed that, then does it continue to execute foreign codes as the exception arises or not? What does it do?

A. The sequence is that the generated code recognizes that there's a condition that needs to be raised. What happens next is that it branches to a piece of code that runs the documentation which recovers the instruction pointer, which they call the PC in this environment. Then it goes to an additional block of code

that will eventually end up back in the interpreter, and the interpreter will rerun the offending instruction. So we have an example of that a little bit later.

(Trial Tr. 701-702).

C. There Is Also Substantial Evidence Of Induced Infringement Of Claim 15

Cascades presented substantial evidence of induced infringement of claim 15 of the ‘750 patent. There was testimony that Samsung knew of the ‘750 patent (DX-538) and evidence of direct infringement of claim 15 (35 U.S.C. § 271(c)), as well as evidence that the Samsung devices “necessarily infringe the patent in suit.” *Acco Brands, Inc. v. ABA Locks Mfg. Co.*, 501 F.3d 1307, 1313 (Fed. Cir. 2007).

Mr. Purdy testified that Samsung provides detailed information to its customers instructing them on how to practice the invention of claim 15 (Trial Tr. 719-721; PX-470 and PX 48 (“They tell how to use the phone, how to run apps ...). He showed where each element of claim 15 was practiced by users of the Samsung devices (Trial Tr. 722-724). Further, Mr. Purdy demonstrated how there are errors in code language: “Nobody that I’ve ever worked with in 45 years writes perfect code” (Trial Tr. 714) and therefore it is impossible for the Samsung device to operate without ever encountering errors (Trial Tr. 714-715). Samsung provides guidelines to programmers on how to control errors, recognizing errors are common (Trial Tr. 715-717).

IV. THERE IS SUBSTANTIAL EVIDENCE OF DAMAGES

There is ample evidence from which the jury can determine a royalty amount. A trial court may not award a “zero royalty” if there are any facts sufficient to support a reasonable royalty. *Apple Inc. v. Motorola Inc.*, 757 F.3d 1286, 1328 (Fed. Cir. 2014); *see also, Info-Hold, Inc. v. Muzak LLC*, 783 F.3d 1365, 1371 (Fed Cir. 2015).

A. The License Agreements Establish The Baseline For Damages

The Federal Circuit has held that estimating a reasonable royalty is not an exact science, and that weaknesses in particular approaches can be addressed in cross-examination:

This court has also recognized that estimating a "reasonable royalty" is not an exact science. As such, the record may support a range of "reasonable" royalties, rather than a single value. Likewise, *there may be more than one reliable method for estimating a reasonable royalty. ... All approaches have certain strengths and weaknesses and, depending upon the facts, one or all may produce admissible testimony in a single case. It is common for parties to choose different, reliable approaches in a single case and, when they do, the relative strengths and weaknesses may be exposed at trial or attacked during cross-examination.* That one approach may better account for one aspect of a royalty estimation does not make other approaches inadmissible.... The fact that one of these methods may be said to more accurately value this aspect of a reasonable royalty calculation does not, necessarily, make the other approach inadmissible.

Apple Inc. v. Motorola Inc., 757 F.3d 1286, 1314 (Fed. Cir. 2014) (emphasis added).

B. The Comparable Licenses Establish A Basis For Determining The Appropriate Royalty Award

The Federal Circuit "has recognized that licenses may be presented to the jury to help the jury decide an appropriate royalty award." *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1227 (Fed. Cir. 2014).

In *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1211-12 (Fed. Cir. 2010), the court affirmed a damages award based on a single license in spite of differences between the license and the hypothetical negotiation, because the jury was able to consider the differences and properly discount the license. *Id.* at 1212.

In *VirnetX, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1330 (Fed. Cir. 2014), the court affirmed admission of expert testimony about a reasonable royalty rate based on six licenses, rejecting an argument that the licenses were not sufficiently comparable to the damages issue. *Id.*

In *Apple, Inc. v. Motorola Inc.*, 757 F.3d at 1286, the Federal Circuit again confirmed that a party can estimate a reasonable royalty by using the royalty rate from sufficiently comparable

licenses. The court reversed the exclusion of testimony that analyzed licenses to an entire portfolio that included the one patent at issue, and allocated a value to the litigated patent. *Id.* at 1323, 1325-6. “Here, whether these licenses are sufficiently comparable such that Motorola’s calculation is a reasonable royalty goes to the weight of the evidence, not its admissibility.” *Id.* at 1326 (citing *ActiveVideo*, 694 F.3d at 1333).

C. Evidence Supporting Damages

The jury was presented with more than sufficient evidence to support an award of reasonable royalty damages. For example, the following comparable license agreements involving the ‘750 patent were put into evidence:

Exhibit No.	Licensee	Terms	Date
PX-310	Philips	\$50,000 and royalty of \$1 to \$2 per unit depending on sales volumes	07/19/12
PX-311	LG	\$800,000	07/30/12
PX-317	Google/Motorola	\$1,250,000	01/29/14

Other license agreements between Cascades and Acer (PX-312), Pantech (PX-336), Sony (PX-323), SK Hynix (PX-324) and Sharp (PX-319) have all been entered into evidence.

There was also testimony of the fact that the LG and Google licenses are closest in comparison to Samsung:

A. I think the LG and the Google licenses are the closest to Samsung.

Q. Why?

A. Well, LG -- first of all, they're the two agreements with companies that had appreciable market share. So LG had four percent, Google had -- or Motorola had 5.7 percent. All the other ones were under the radar. They're really less than one percent. They're very small. So there were only two agreements, you know, that, to start with, dealt with anyone with an appreciable market share.

And, secondly, LG is a company that is, as I said, almost a sister company of Samsung in Korea. And they're direct competitors in a lot of areas. And I view them in some of the same light because of their -- the commonality of that.

(Trial Tr. at 395-396).

Finally, Mr. Brown explained the market share comparison of Samsung to LG and to Google and used a demonstrative chart to show the adjusted royalty amount:

	<u>Royalty Amount</u>	<u>Unit Sales (000's)</u>	<u>Samsung Unit Sales (000's)</u>	<u>Adjusted Amount</u>
LG (Worldwide)	\$800,000	6,890	50,334	\$5.84M
Motorola (US)	\$1,250,000	915	9,543	\$13.0M

(PDX-70). Mr. Brown testified that based upon the LG license (PX-311) and the Motorola license (PX-317), reasonable royalty damages could be either \$5.84 million or \$13 million (Trial Tr. 397-98). (The total volume of Samsung infringing units (89 million units) was also in evidence (PX-49 and PX-352)).

D. Expert Testimony Is Not Necessary To Prove Damages

Samsung claims that Mr. Brown's testimony is unreliable because he is not an expert (Dkt. 341, pp. 13-15). But, a damages expert is not necessary to prove damages in a patent infringement case. In *Dow Chemical Co. v. Mee Industries, Inc.*, 341 F.3d 1370 (Fed. Cir. 2003), the defendant argued that, on remand, the plaintiff could not prove damages because its expert had been excluded. The Federal Circuit ruled otherwise:

The applicable statute, 35 U.S.C. § 284, provides in relevant part:

Upon finding for the claimant *the court shall award the claimant damages* adequate to compensate for the infringement, *but in no event less than a reasonable royalty* for the use made of the invention by the infringer, together with interest and costs as fixed by the court. When the damages are not found by a jury, the court shall assess them.

* * * *

The court may receive expert testimony as an aid to the determination of damages or of what royalty would be reasonable under the circumstances.

35 U.S.C. § 284 (2000) (emphases added). The statute is unequivocal that the district court must award damages in an amount no less than a reasonable royalty. *Id.*; see also *Lindemann Maschinenfabrik GmbH v. Am. Hoist & Derrick Co.*, 895 F.2d 1403, 1406 (Fed. Cir. 1990) ("In patent law, the fact of infringement establishes the fact of damage because the patentee's right to exclude has been violated.") (citing 5 *Chisum on Patents* § 20.03[3], at 20-142 (1986)). **Further, section 284 is clear that expert testimony is not necessary to the award of damages, but rather "may [be] receive[d] ... as an aid."** 35 U.S.C. § 284 (2000) (emphasis added).

341 F.3d at 1381-1382 (bold emphasis added).

The patent statute says two important things on this subject:

[1.] Upon finding for the claimant the court **shall** award the claimant damages adequate to compensate for the infringement but in no event less than a reasonable royalty ... [2.] The court **may** receive expert testimony as an aid to the determination of damages or of what royalty would be reasonable under the circumstances.

35 U.S.C. § 284 (emphasis added). Expert testimony is not required.

Finally, even where expert testimony is presented for both parties, the jury is not obligated to adopt either expert's theory wholesale. *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1212 (Fed. Cir. 2010) (rejecting the defendant's argument that the jury blindly adopted the plaintiff's expert's analysis).

V. THERE IS SUBSTANTIAL EVIDENCE OF WILLFUL INFRINGEMENT

Cascades must demonstrate a highly objective likelihood that its actions constituted infringement of a valid patent. *In re Seagate Tech., LLC*, 497 F.3d 1360 (Fed. Cir. 2007). If the threshold objective standard is satisfied, Cascades must establish that the objectively defined risk was either known or so obvious that it should have been known to Samsung. *Id.* Proof of invalidity at trial does not necessarily negate willfulness. *I4i L.P. v. Microsoft Corp.*, 598 F.3d 831 (Fed. Cir. 2010).

Here, there is substantial evidence of willful infringement by Samsung.

- Samsung was provided notice of the ‘750 patent by letter on April 7, 2011 (PX-166; Trial Tr. at 356-358).
- Samsung was provided with claim charts comparing the claims of the ‘750 patent with the Nexus Android product made by Samsung (PX-172; Trial Tr. at 358-359).
- Cascades met with Samsung in which the ‘750 patent was on the meeting agenda, but Samsung provided “no response at all” to Cascades’ claim of infringement of the ‘750 patent (PX-173; Trial Tr. 360-361).
- Samsung’s technical witness, Hakryoul Kim, testified that the original Kit Kat version of Android implemented by Samsung ran the alternative Android Run-Time (ART) feature in the Samsung Galaxy S5 “flagship” devices (Trial Tr. at 829-832, 331-332). All other devices provided the Dalvik JIT Compiler (Trial Tr. at 830).
- Samsung had an alternative to the Dalvik machine, but made a decision not to implement the ART platform (Trial Tr. at 833).

VI. JMOL ON INVALIDITY IS IMPROPER

There was substantial evidence supporting the validity of the ‘750 patent. The ‘750 patent, like all patents, is presumed valid. 35 U.S.C. § 282. Samsung did not overcome that presumption.

First, the *Le* prior art patent was uncovered in the Patent Examiner’s search (PX-2) and necessarily found less relevant than the Kelly ‘205 patent (PX-661) that was used as a basis to reject the ‘750 claims (Trial Tr. 678-832). Second, Mr. Purdy showed that the *Le* patent did not anticipate either claims 1 or 15 -- key elements were not disclosed in *Le* (Trial Tr. 678-683). Third, Dr. Medvidovic admitted the words of claims 1 and 15 could not be found in *Le* (Trial Tr.

997-999). Fourth, Dr. Medvidovic used the wrong standard for obviousness -- hindsight (Trial. Tr. 984-986).

VII. CONCLUSION

The motion for JMOL should be denied.

Dated: July 19, 2015

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that on July 19, 2015 the foregoing:

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INFRINGEMENT, DAMAGES AND WILLFULNESS**

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I certify that all parties in this case are represented by counsel who are CM/ECF participants.

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